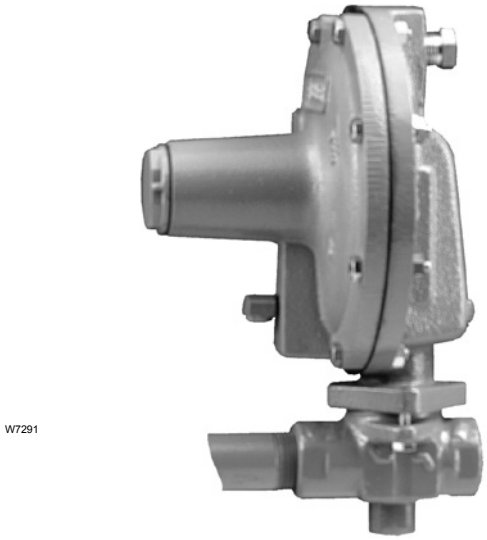
May 2012

Y690A Series Pressure Reducing Regulators

TYPE Y690A



TYPE Y690AH

Figure 1. *Y690A Series Direct-Operated Pressure Reducing Regulators*

Features

- **Easy Conversion Between Constructions**—Converts easily from the Type Y690A to the Type Y690AM with two O-rings and one machine screw.
- **Sour Gas Service Capability**—For sour gas applications, the Y690A Series regulators are available in materials that comply with NACE International Standards MR0175 and MR0103.
- **Inlet Pressure Equals Outlet Pressure**—Full inlet pressure capability on the downstream side of the regulator.
- **Corrosion Resistance**—Multiple regulator constructions are available in a variety of materials for compatibility with corrosive process gases.
- **Multiple Applications**—The Y690A Series can be used for a wide variety of gases including air, nitrogen, natural gas, sour gas, butane, and propane.

Introduction

The Y690A Series self-contained, spring-loaded regulators (Figure 1) provide economical pressure reducing control in a variety of commercial and industrial applications. The Y690A Series design is ideally suited to control gas supply to in-plant processing equipment. The rugged casings and sliding pusher post design withstand the full 150 psig / 10.3 bar inlet pressure at both the inlet and outlet connections. The sliding pusher post design prevents damage to internal parts if the downstream pressure exceeds the setpoint. Because these regulators can withstand the full inlet pressure, a downstream or internal relief valve is not required to protect the downstream side of the regulator.

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Specifications

Available Configurations

Type Y690A: Direct-operated pressure reducing regulator for outlet pressures up to 7-inches w.c. / 17 mbar equipped with a pitot tube.

Type Y690AH: Direct-operated pressure reducing regulator for outlet pressures up to 7 psig / 483 mbar equipped with a pitot tube.

Type Y690AM: Direct-operated pressure reducing regulator for outlet pressures up to 7-inches w.c. / 17 mbar equipped with a blocked throat and O-ring stem seal. The lower diaphragm casing is tapped 1/2 NPT for control line connection.

Type Y690AHM: Direct-operated pressure reducing regulator for outlet pressures up to 7 psig / 483 mbar equipped with a blocked throat and O-ring stem seal. The lower diaphragm casing is tapped 1/2 NPT for control line connection.

Body Size
NPS 3/4 or 1 / DN 20 or 25

End Connection Styles
See Table 1

Maximum Allowable Inlet Pressure(1)
150 psig / 10.3 bar

Maximum Operating Inlet Pressure(1)
See Table 4

Maximum Outlet (Casing) Pressure(1)
150 psig / 10.3 bar

Maximum Emergency Outlet Pressure to Avoid Internal Parts Damage(1)
150 psig / 10.3 bar

Pressure Registration
Types Y690A and Y690AH: Internal
Types Y690AM and Y690AHM: External

Outlet Pressure Ranges(1)
See Table 5

Orifice Sizes and Flow and Sizing Coefficients
See Table 2

Flow Capacities
See Tables 6 and 7

Construction Materials
See Table 3

Temperature Capabilities(1)
Nitrile (NBR):
-20 to 180°F / -29 to 82°C
Fluorocarbon (FKM):
40 to 300°F / 4 to 149°C
Ethylenepropylene (EPDM):
-20 to 275°F / -29 to 135°C
Perfluoroelastomer (FFKM):
-20 to 300°F / -29 to 149°C

Pressure Setting Adjustment
Adjusting Screw

Spring Case Connection
1/4 NPT

Diaphragm Case Connection
1/2 NPT

Approximate Weight
19 pounds / 8.6 kg

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

Table 1. *Body Size and End Connection Styles*

BODY SIZE	END CONNECTION STYLES	
	Ductile Iron	Stainless Steel
NPS 3/4 or 1 / DN 20 or 25	NPT	NPT, CL150 RF, CL300 RF, or PN 16/25/40

Table 2. *Flow and Sizing Coefficients*

ORIFICE SIZE		WIDE-OPEN C_g FOR RELIEF VALVE SIZING	WIDE-OPEN C_V FOR RELIEF VALVE SIZING	C_1	IEC SIZING COEFFICIENTS		
Inches	mm				X_T	F_D	F_L
1/8	3.2	12.3	0.35	35	0.78	0.50	0.89
1/4	6.4	50	1.43				
3/8	9.5	110	3.14				
1/2	13	200	5.71				
9/16	14	250	7.14				

Table 3. *Construction Materials*

BODY	DIAPHRAGM CASE	SPRING CASE	TRIM	DIAPHRAGM	DISK
Ductile iron, Stainless steel	Ductile iron or Stainless steel	Ductile iron or Stainless steel	Stainless steel	Nitrile (NBR), Fluorocarbon (FKM), or Polytetrafluoroethylene (PTFE) bonded Nitrile (NBR)	Nitrile (NBR), Fluorocarbon (FKM), Perfluoroelastomer (FFKM), PTFE, or Ethylenepropylene (EPDM)

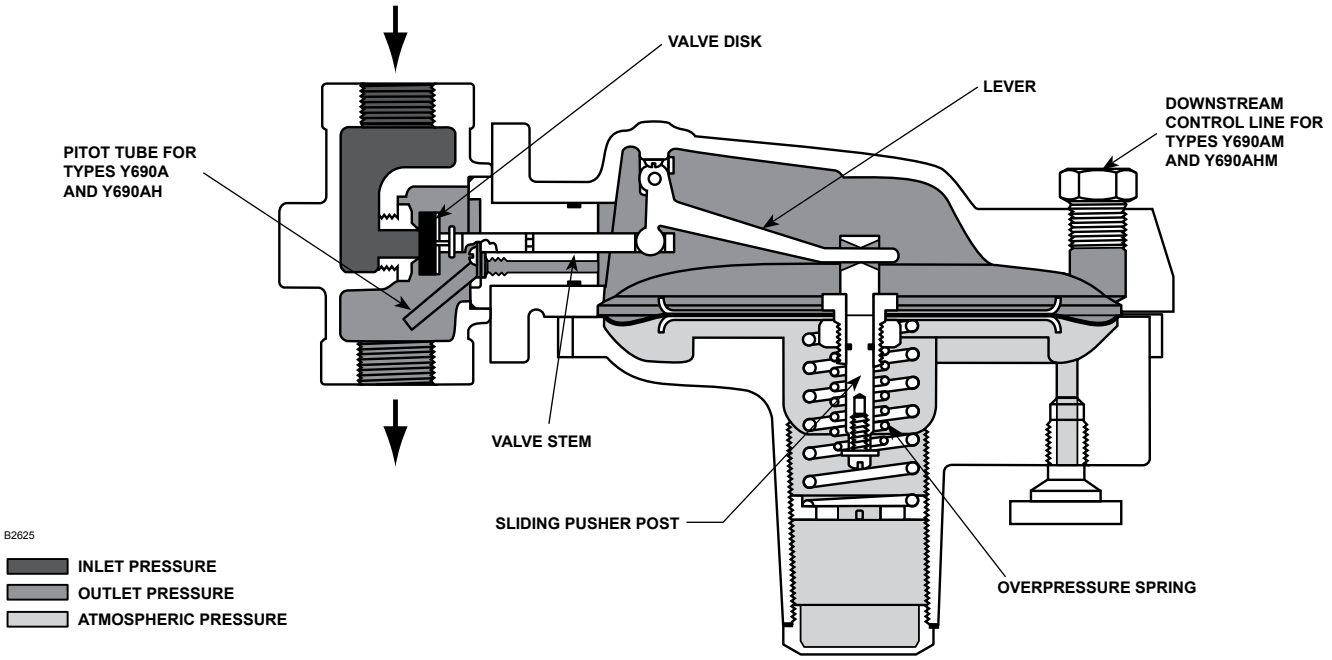

Figure 2. *Y690A Series Operational Schematic*

Principle of Operation

Refer to Figure 2. When downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by a spring). Through the action of the sliding pusher post assembly, lever, and valve stem the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward, the valve disk moves away from the orifice, and the gas flow increases.

Product Description

Y690A Series Pressure Reducing Regulators

Very low-pressure (Types Y690A and Y690AM) and higher-pressure versions (Types Y690AH and Y690AHM) are available for operating inlet pressures to 150 psig / 10.3 bar and outlet pressures settings from 1-inch w.c. to 7 psig / 2.5 mbar to 0.5 bar. Refer to Table 5 for outlet pressure ranges of each type. These regulators are available in NPS 3/4 and 1 / DN 20 and 25 body sizes with the end connections as shown in Table 1.

Downstream Control Line

The Types Y690AM and Y690AHM regulators have a blocked throat stem seal with O-rings and a 1/2 NPT control line connection in the diaphragm case. It is used for monitoring applications or other applications where additional equipment is installed between the regulator and the pressure control point. The stem seal separates the body outlet pressure from the diaphragm case.

Sliding Pusher Post

The diaphragm assembly of the regulator is equipped with a sliding pusher post. During an overpressure situation (outlet pressure above setpoint or lockup pressure), the spring of the sliding pusher post is compressed, allowing the diaphragm head to come to rest on the spring case. This action prevents any damage to internal parts.

Table 4. *Maximum Operating Inlet Pressures*

ORIFICE SIZE		OUTLET PRESSURE RANGE															
		Types Y690A and Y690AM				Types Y690AH and Y690AM											
Inches	mm	1 to 2.5-inches w.c. / 2.5 to 6.2 mbar		2.5 to 7-inches w.c. / 6.2 to 17 mbar		5 to 10-inches w.c. / 12 to 25 mbar		7 to 16-inches w.c. / 17 to 40 mbar		15-inches w.c. to 1.2 psig / 37 to 83 mbar		1.2 to 2.5 psig / 83 to 172 mbar		2.5 to 4.5 psig / 0.17 to 0.31 bar		4.5 to 7 psig / 0.31 to 0.48 bar	
		psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar
1/8	3.2	150	10.3	150	10.3	150	10.3	150	10.3	150	10.3	150	10.3	150	10.3	150	10.3
1/4 3/8	6.4 9.5	40 20	2.8 1.4	60 20	4.1 1.4	75 35	5.2 2.4	75 35	5.2 2.4	75 35	5.2 2.4	150 60	10.3 4.1	150 60	10.3 4.1	150 60	10.3 4.1
1/2 9/16	13 14	10 5	0.69 0.34	10 5	0.69 0.34	8 5	0.55 0.34	8 5	0.55 0.34	8 5	0.55 0.34	10 6	0.69 0.41	12 8	0.83 0.55	12 8	0.83 0.55

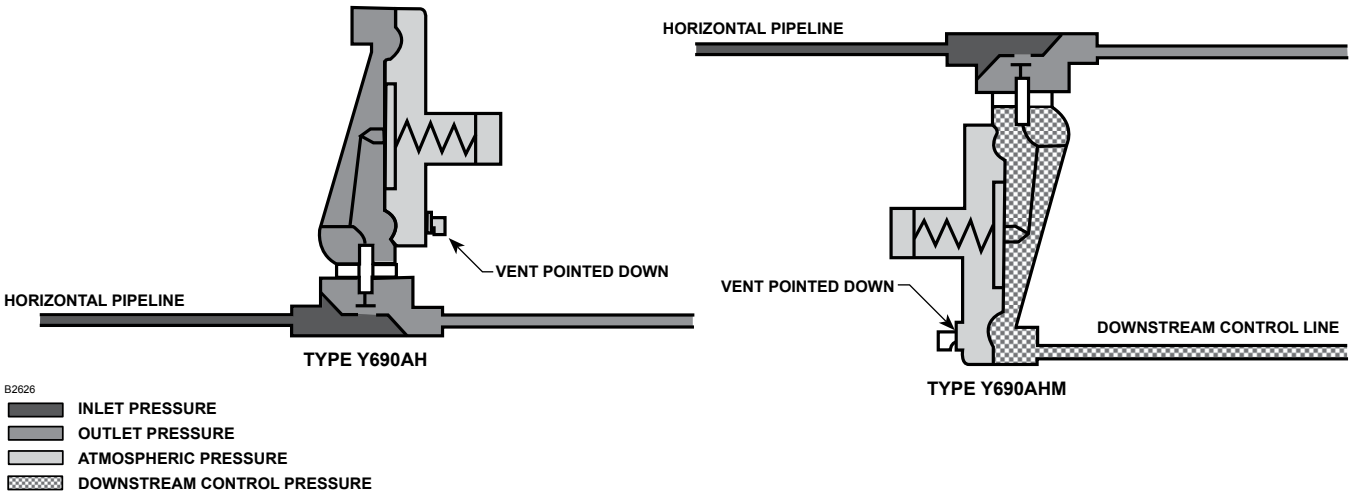

Figure 3. *Types Y690AH and Y690AHM Actuator Casing Drainage Schematic*

Table 5. *Outlet Pressures and Spring Part Numbers*

TYPES	OUTLET CONTROL PRESSURE RANGES	SPRING PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
				Inches	mm	Inches	mm
Y690A and Y690AM	1 to 2.5-inches w.c. / 2 to 6 mbar	1B558527052(1)(2)	Orange	0.072	1.8	3.78	96.0
	2.5 to 7-inches w.c. / 6 to 17 mbar	1B653827052(1)	Red	0.085	2.2	3.63	92.2
Y690AH and Y690AHM	5 to 10-inches w.c. / 12 to 25 mbar	1B653827052	Red	0.085	2.2	3.63	92.2
	7 to 16-inches w.c. / 17 to 40 mbar	1B653927022	Unpainted	0.105	2.7	3.75	95.2
	15-inches w.c. to 1.2 psig / 37 to 83 mbar	1B537027052	Yellow	0.114	2.9	4.31	109
	1.2 to 2.5 psig / 83 to 172 mbar	1B537127022	Light green	0.156	4.0	4.06	103
	2.5 to 4.5 psig / 0.17 to 0.31 bar	1B537227022	Light blue	0.187	4.8	3.94	100
	4.5 to 7 psig / 0.31 to 0.48 bar	1B537327052	Black	0.218	5.5	3.98	101

1. To achieve the published outlet pressure range the spring case must be installed pointing down.
2. Do not use Fluorocarbon (FKM) diaphragm with this spring at diaphragm temperatures lower than 60°F / 16°C.

Installation

Y690A Series regulators may be installed in any orientation as long as flow through the body matches the direction of the arrow cast on the body. Normal installation is with the spring case barrel vertical above or below the diaphragm case. However, when using a Type Y690A or Y690AM regulator, for proper operation to achieve the published capacities, the spring case barrel should be installed pointed down. For actuator casing drainage of the Types Y690AH and Y690AHM, regulators should be installed as shown in Figure 3. When exposed to the weather, the spring case vent should be pointed downward to allow condensate to drain. On indoor installations, the vent should be piped outdoors if used in hazardous gas service. External dimensions and connections are shown in Figure 4.

Capacity Information

Tables 6 and 7 give the regulating capacities of the Y690A Series regulators at selected inlet pressures and outlet pressure settings. Flows are in SCFH (60°F and 14.7 psia) of 0.6 specific gravity natural gas. For gases of other specific gravities, divide the given capacity by the square root of the appropriate specific gravity of the gas required. Then, if capacity is desired in normal cubic meters per hour at 0°C and 1.01325 bar, multiply SCFH by 0.0268. To determine wide-open flow capacities for relief sizing, use the following formula:

$$Q = \sqrt{\frac{520}{GT}}\, C_g P_1 \mathrm{Sin}\left[\frac{3417}{C_1}\sqrt{\frac{\triangle P}{P_1}}\right] \mathrm{Deg}$$

where,

C_g = gas sizing coefficient from Table 2
C_1 = C_g / C_v, or 35 from Table 2
G = gas specific gravity (air = 1.0)
P_{1abs} = inlet pressure, psia (add 14.7 psi to gauge inlet pressure to obtain absolute inlet pressure)
Q = flow rate, SCFH
T = absolute temperature in °Rankine of gas at inlet

Table 6. *Types Y690A and Y690AM Capacities*

BODY SIZE	OUTLET PRESSURE RANGE, PART NUMBER, AND COLOR	OUTLET PRESSURE SETTING	INLET PRESSURE		CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS[1]				
					Orifice Size				
			psig	bar	1/8 Inches / 3.2 mm	1/4 Inches / 6.4 mm	3/8 Inches / 9.5 mm	1/2 Inches / 13 mm	9/16 Inches / 14 mm
NPS 3/4 / DN 20	1 to 2.5-inches w.c. / 2.5 to 6.2 mbar 1B558527052 Orange	1-inch w.c. / 2.5 mbar	2	0.14	155 / 4.1	387 / 10.4	452 / 12.1	593 / 15.9	774 / 20.7
			5	0.34	232 / 6.2	529 / 14.2	581 / 15.6	774 / 20.7	903 / 24.2
			10	0.69	258 / 6.9	658 / 17.6	684 / 18.3	1032 / 27.7	
			20	1.4	361 / 9.7	787 / 21.1	839 / 22.5		
			40	2.8	774 / 20.7	1251 / 33.5			
			60	4.1	1032 / 22.7				
			80	5.5	1161 / 31.1				
			100	6.9	1290 / 34.6				
			125	8.6	1548 / 41.5				
			150	10.3	1677 / 44.9				
		2.5-inches w.c. / 6.2 mbar	2	0.14	155 / 4.1	452 / 12.1	516 / 13.8	826 / 22.1	993 / 26.6
			5	0.34	258 / 6.9	645 / 17.3	774 / 20.7	1058 / 28.3	1226 / 32.9
			10	0.69	284 / 7.6	851 / 22.8	968 / 25.9	1316 / 35.3	
			20	1.4	361 / 9.7	993 / 26.6	1226 / 32.9		
			40	2.8	839 / 22.5	1316 / 35.3			
			60	4.1	1161 / 31.1				
			80	5.5	1355 / 36.3				
			100	6.9	1484 / 39.8				
			125	8.6	1548 / 41.5				
			150	10.3	1613 / 43.2				
	2.5 to 7-inches w.c. / 6.2 to 17 mbar 1B653827052 Red	2.5-inches w.c. / 6.2 mbar	2	0.14	155 / 4.1	258 / 6.9	297 / 7.9	581 / 15.6	632 / 17.1
			5	0.34	232 / 6.2	348 / 9.3	684 / 18.3	774 / 20.7	877 / 23.5
			10	0.69	297 / 7.8	581 / 15.6	903 / 24.2	1045 / 28.0	
			20	1.4	323 / 8.7	813 / 21.8	1161 / 31.1		
			40	2.8	774 / 20.7	1122 / 30.1			
			60	4.1	1006 / 26.9	1613 / 43.2			
			80	5.5	1226 / 32.9				
			100	6.9	1303 / 34.9				
			125	8.6	1484 / 39.8				
			150	10.3	1561 / 41.8				
		3-inches w.c. / 7.5 mbar	2	0.14	142 / 3.8	245 / 6.6	297 / 7.9	542 / 14.5	593 / 16.0
			5	0.34	168 / 4.5	348 / 9.3	645 / 17.3	787 / 21.1	877 / 23.5
			10	0.69	245 / 6.6	581 / 16.6	903 / 24.2	1019 / 27.3	
			20	1.4	323 / 8.7	813 / 21.8	1161 / 31.1		
			40	2.8	748 / 20.0	1109 / 29.7			
			60	4.1	916 / 24.5	1355 / 36.3			
			80	5.5	1277 / 34.2				
			100	6.9	1458 / 39.1				
			125	8.6	1651 / 44.2				
			150	10.3	1716 / 46.0				
		7-inches w.c. / 17 mbar	2	0.14	155 / 4.1	206 / 5.5	245 / 6.6	400 / 10.7	516 / 13.8
			5	0.34	245 / 6.6	284 / 7.6	568 / 15.2	671 / 18.0	774 / 20.7
			10	0.69	258 / 6.9	516 / 13.8	851 / 22.8	980 / 26.3	
			20	1.4	284 / 7.6	697 / 18.7	1213 / 32.5		
			40	2.8	632 / 16.9	929 / 24.9			
			60	4.1	774 / 20.7	1290 / 34.6			
			80	5.5	864 / 23.2				
			100	6.9	1019 / 27.3				
			125	8.6	1084 / 29.1				
			150	10.3	1367 / 36.6				

1. Deviation from setpoint is -1 to 2-inches w.c. / -2.5 to 5 mbar.
▭ - Shaded areas indicate maximum allowable inlet pressure is exceeded.

- continued -

Table 6. *Types Y690A and Y690AM Capacities (continued)*

BODY SIZE	OUTLET PRESSURE RANGE, PART NUMBER, AND COLOR	OUTLET PRESSURE SETTING	INLET PRESSURE		CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS[1]				
					Orifice Size				
			psig	bar	1/8 Inches / 3.2 mm	1/4 Inches / 6.4 mm	3/8 Inches / 9.5 mm	1/2 Inches / 13 mm	9/16 Inches / 14 mm
NPS 1 / DN 25	1 to 2.5-inches w.c. / 2.5 to 6.2 mbar 1B558527052 Orange	1-inch w.c. / 2.5 mbar	2	0.14	142 / 3.8	400 / 10.7	593 / 15.9	619 / 16.6	1226 / 32.9
			5	0.34	245 / 6.6	452 / 12.1	1277 / 34.2	1419 / 38.1	1471 / 39.4
			10	0.69	310 / 8.3	1032 / 27.7	1445 / 38.7	1961 / 52.6	
			20	1.4	452 / 12.1	1200 / 32.2	1703 / 45.6		
			40	2.8	839 / 22.5	1445 / 38.7			
			60	4.1	1238 / 33.2				
			80	5.5	1509 / 40.4				
			100	6.9	1677 / 44.9				
			125	8.6	1767 / 47.4				
			150	10.3	1832 / 49.1				
		2.5-inches w.c. / 6.2 mbar	2	0.14	155 / 4.1	374 / 10.0	439 / 11.8	606 / 16.2	1019 / 27.3
			5	0.34	258 / 6.9	452 / 12.1	955 / 25.6	1200 / 32.2	1471 / 39.4
			10	0.69	310 / 8.3	955 / 25.6	1213 / 32.5	1600 / 42.9	
			20	1.4	452 / 12.1	1161 / 31.1	1613 / 43.2		
			40	2.8	774 / 20.7	1587 / 42.5			
			60	4.1	1213 / 32.5				
			80	5.5	1509 / 40.4				
			100	6.9	1677 / 44.9				
			125	8.6	1793 / 48.1				
			150	10.3	1948 / 52.2				
	2.5 to 7-inches w.c. / 6.2 to 17 mbar 1B653827052 Red	2.5-inches w.c. / 6.2 mbar	2	0.14	142 / 3.8	168 / 4.5	348 / 9.3	606 / 16.2	813 / 21.8
			5	0.34	232 / 6.2	387 / 10.4	761 / 20.4	980 / 26.3	1109 / 29.7
			10	0.69	335 / 8.9	774 / 20.7	1032 / 27.7	1393 / 37.3	
			20	1.4	413 / 11.1	851 / 22.8	1471 / 39.4		
			40	2.8	748 / 20.0	1251 / 33.5			
			60	4.1	1135 / 30.4	1677 / 44.9			
			80	5.5	1303 / 34.9				
			100	6.9	1548 / 41.5				
			125	8.6	1651 / 44.2				
			150	10.3	1806 / 48.4				
		3-inches w.c. / 7.5 mbar	2	0.14	129 / 3.5	194 / 5.2	258 / 6.9	568 / 15.2	645 / 17.3
			5	0.34	219 / 5.9	387 / 10.4	722 / 19.4	722 / 19.4	864 / 23.2
			10	0.69	323 / 8.7	684 / 18.3	916 / 24.5	1084 / 29.1	
			20	1.4	387 / 10.4	851 / 22.8	1303 / 34.9		
			40	2.8	658 / 17.6	1251 / 33.5			
			60	4.1	968 / 25.9	1677 / 44.9			
			80	5.5	1290 / 34.6				
			100	6.9	1548 / 41.5				
			125	8.6	1651 / 44.2				
			150	10.3	1806 / 48.4				
		7-inches w.c. / 17 mbar	2	0.14	129 / 3.5	194 / 5.2	258 / 6.9	477 / 12.8	503 / 13.5
			5	0.34	219 / 5.9	387 / 10.4	555 / 14.9	684 / 18.3	851 / 22.8
			10	0.69	258 / 6.9	490 / 13.1	748 / 20.0	1071 / 28.7	
			20	1.4	361 / 9.7	787 / 21.1	1006 / 27.0		
			40	2.8	516 / 13.8	1006 / 27.0			
			60	4.1	735 / 19.7	1677 / 44.9			
			80	5.5	839 / 22.5				
			100	6.9	968 / 25.9				
			125	8.6	1109 / 29.7				
			150	10.3	1458 / 39.1				

1. Deviation from setpoint is -1 to 2-inches w.c. / -2.5 to 5 mbar.
▭ - Shaded areas indicate maximum allowable inlet pressure is exceeded.

Table 7. *Types Y690AH and Y690AHM Capacities*

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE		NPS 3/4 / DN 20 BODY SIZE				
					Capacities in SCFH / Nm³/h of 0.6 Specific Gravity Natural Gas				
					Orifice Size				
			psig	bar	1/8 Inches / 3.2 mm	1/4 Inches / 6.4 mm	3/8 Inches / 9.5 mm	1/2 Inches / 13 mm	9/16 Inches / 14 mm
5 to 10-inches w.c. / 12 to 25 mbar 1B653827052 Red	1-inch w.c. / 2.5 mbar	7-inches w.c. / 17 mbar	1	0.07	90 / 2.4	232 / 6.2	245 / 6.6	413 / 11.1	439 / 11.8
			5	0.34	219 / 5.9	452 / 12.1	490 / 13.1	516 / 13.8	968 / 25.9
			8	0.55	232 / 6.2	529 / 14.1	542 / 14.5	593 / 15.9	
			20	1.4	516 / 13.8	619 / 16.6	645 / 17.2		
			35	2.4	658 / 17.6	839 / 22.5	903 / 24.2		
			75	5.2	774 / 20.7	955 / 25.6			
			150	10.3	1677 / 44.9				
7 to 16-inches w.c. / 17 to 40 mbar 1B653927022 Olive drab	1-inch w.c. / 2.5 mbar	11-inches w.c. / 27 mbar	1	0.069	90 / 2.4	155 / 4.1	194 / 5.2	232 / 6.2	245 / 6.6
			5	0.34	155 / 4.1	284 / 7.6	348 / 9.3	529 / 14.2	748 / 20.4
			8	0.55	168 / 4.5	426 / 11.4	452 / 12.1	542 / 14.0	
			20	1.4	348 / 9.3	593 / 16.0	606 / 16.2		
			35	2.4	516 / 13.8	619 / 16.6	645 / 17.3		
			75	5.2	645 / 17.3	942 / 25.2			
			150	10.3	1677 / 44.9				
15-inches w.c. to 1.2 psig / 37 to 83 mbar 1B537027052 Yellow	5.5-inches w.c. / 14 mbar	15-inches w.c. / 37 mbar	2	0.14	90 / 2.4	503 / 13.5	903 / 24.2	1097 / 29.4	1148 / 30.8
			6	0.41	245 / 6.6	929 / 24.9	1638 / 43.9	2103 / 56.4	
			10	0.69	335 / 9.0	1380 / 37.0	1935 / 51.9		
			30	2.1	684 / 18.3	2387 / 64.0	2451 / 65.7		
			60	4.1	1161 / 31.1	3483 / 93.3			
			150	10.3	2567 / 68.8				
		1.2 psig / 83 mbar	2	0.14	90 / 2.4	413 / 11.1	606 / 16.2	813 / 21.8	697 / 18.7
			6	0.41	245 / 6.6	697 / 18.7	1290 / 34.6	1419 / 38.0	
			10	0.69	310 / 8.3	1019 / 27.3	1419 / 38.0		
			30	2.1	671 / 18.0	2064 / 55.3	2425 / 65.0		
			60	4.1	1135 / 30.4	3354 / 90.0			
			150	10.3	2477 / 66.4				
1.2 to 2.5 psig / 83 to 172 mbar 1B537127022 Light green	0.2 psig / 14 mbar	1.2 psig / 83 mbar	2	0.14	116 / 3.1	219 / 5.9	348 / 9.3	490 / 13.1	516 / 13.8
			6	0.41	181 / 4.8	452 / 12.1	735 / 19.7	851 / 22.8	1071 / 28.7
			10	0.69	194 / 5.2	593 / 15.9	1006 / 27.0	1174 / 31.5	
			30	2.1	555 / 14.9	1548 / 41.5	1716 / 46.0		
			60	4.1	864 / 23.2	2477 / 66.4	2335 / 62.6		
			150	10.3	1987 / 53.3	5108 / 137			
		2.5 psig / 172 mbar	6	0.41	129 / 3.5	258 / 6.9	452 / 12.1	593 / 15.9	684 / 18.3
			10	0.69	168 / 4.5	490 / 13.1	568 / 15.2	864 / 23.2	
			30	2.1	426 / 11.4	980 / 26.3	1032 / 27.7		
			60	4.1	748 / 20.0	1935 / 51.9	2245 / 60.2		
			150	10.3	1484 / 39.8	3354 / 89.9			

▭ - Shaded areas indicate inlet pressure is too high for orifice size.

- continued -

Table 7. *Types Y690AH and Y690AHM Capacities (continued)*

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE		NPS 3/4 / DN 20 BODY SIZE Capacities in SCFH / Nm³/h of 0.6 Specific Gravity Natural Gas Orifice Size				
			psig	bar	1/8 Inches / 3.2 mm	1/4 Inches / 6.4 mm	3/8 Inches / 9.5 mm	1/2 Inches / 13 mm	9/16 Inches / 14 mm
2.5 to 4.5 psig / 172 to 310 mbar 1B537227022 Light blue	0.3 psig / 21 mbar	2.5 psig / 172 mbar	4	0.28	142 / 3.8	194 / 5.2	310 / 8.3	374 / 10.0	477 / 12.8
			8	0.55	142 / 3.8	361 / 9.7	516 / 13.8	710 / 19.0	800 / 21.4
			12	0.83	194 / 5.2	490 / 13.1	684 / 18.3	929 / 24.9	
			30	2.1	426 / 11.4	903 / 24.2	1109 / 29.7		
			60	4.1	658 / 17.6	1729 / 46.3	1832 / 49.1		
			150	10.3	1574 / 42.2	4618 / 123			
		4.5 psig / 310 mbar	8	0.55	116 / 3.1	245 / 6.6	400 / 10.7	516 / 13.8	542 / 14.5
			12	0.83	155 / 4.1	323 / 8.7	529 / 14.2	722 / 19.4	
			30	2.1	297 / 8.0	761 / 20.4	826 / 22.1		
			60	4.1	593 / 15.9	1226 / 32.9	1342 / 36.0		
			150	10.3	1226 / 32.9	3612 / 96.8			
4.5 to 7 psig / 310 to 483 mbar 1B537327052 Black	0.7 psig / 48 mbar	4.5 psig / 310 mbar	9	0.62	194 / 5.2	426 / 11.4	619 / 16.6	929 / 24.9	993 / 26.6
			12	0.83	206 / 5.5	555 / 14.9	813 / 21.8	1148 / 30.6	
			30	2.1	516 / 13.8	1097 / 29.4	1806 / 48.4		
			60	4.1	864 / 23.2	2051 / 55.0	2709 / 72.6		
			150	10.3	1961 / 52.6	5044 / 135			
		7 psig / 483 mbar	9	0.62	155 / 4.1	271 / 7.3	516 / 13.8	619 / 16.6	658 / 17.6
			12	0.83	194 / 5.2	374 / 10.0	645 / 17.3	864 / 23.2	
			30	2.1	387 / 10.4	903 / 24.2	1329 / 35.6		
			60	4.1	800 / 21.4	1716 / 46.0	2451 / 65.7		
			150	10.3	1909 / 51.2	4051 / 10.6			

▭ - Shaded areas indicate inlet pressure is too high for orifice size.

Table 7. *Types Y690AH and Y690AHM Capacities*

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE		NPS 1 / DN 25 BODY SIZE Capacities in SCFH / Nm³/h of 0.6 Specific Gravity Natural Gas Orifice Size				
			psig	bar	1/8 Inches / 3.2 mm	1/4 Inches / 6.4 mm	3/8 Inches / 9.5 mm	1/2 Inches / 13 mm	9/16 Inches / 14 mm
5 to 10-inches w.c. / 12 to 25 mbar 1B653827052 Red	1-inch w.c. / 2.5 mbar	7-inches w.c. / 17 mbar	1	0.069	90 / 2.4	245 / 6.6	297 / 8.0	413 / 11.1	529 / 14.2
			5	0.34	219 / 5.9	452 / 12.1	1135 / 30.4	1896 / 50.8	1922 / 51.5
			8	0.55	232 / 6.2	529 / 14.2	2141 / 57.4	2361 / 63.3	
			20	1.4	516 / 13.8	1806 / 48.4	1174 / 31.5(1)		
			35	2.4	710 / 19.0	2296 / 61.5(1)	929 / 24.9(1)		
			75	5.2	1032 / 27.7	1393 / 37.3(1)			
			150	10.3	1677 / 44.9(1)				
7 to 16-inches w.c. / 17 to 40 mbar 1B653927022 Olive drab	1-inch w.c. / 2.5 mbar	11-inches w.c. / 27 mbar	1	0.069	90 / 2.4	168 / 4.5	206 / 5.5	232 / 6.2	245 / 6.6
			5	0.34	155 / 4.1	310 / 8.3	516 / 13.8	619 / 16.6	1161 / 31.1
			8	0.55	168 / 4.5	426 / 11.4	1161 / 31.1	1458 / 39.1	
			20	1.4	348 / 9.3	774 / 20.7	1625 / 43.6		
			35	2.4	555 / 14.9	1806 / 48.4	1187 / 31.8(1)		
			75	5.2	1226 / 32.9	1509 / 40.4(1)			
			150	10.3	1742 / 46.7				

1. Indicates capacity limited due to boost.
▭ - Shaded areas indicate inlet pressure is too high for orifice size.

- continued -

Table 7. *Types Y690AH and Y690AHM Capacities (continued)*

OUTLET PRESSURE RANGE, CONTROL SPRING PART NUMBER, AND COLOR	OFFSET FROM SETPOINT	OUTLET PRESSURE SETTING	INLET PRESSURE		NPS 1 / DN 25 BODY SIZE Capacities in SCFH / Nm³/h of 0.6 Specific Gravity Natural Gas Orifice Size				
			psig	bar	1/8 Inches / 3.2 mm	1/4 Inches / 6.4 mm	3/8 Inches / 9.5 mm	1/2 Inches / 13 mm	9/16 Inches / 14 mm
15-inches w.c. to 1.2 psig / 37 to 83 mbar 1B537027052 Yellow	5.5-inches w.c. / 14 mbar	15-inches w.c. / 37 mbar	2	0.14	90 / 2.4	503 / 13.5	1097 / 29.4	1161 / 31.1	1445 / 38.7
			6	0.41	245 / 6.6	929 / 24.9	2503 / 67.1	2799 / 75.0	
			10	0.69	335 / 9.0	1587 / 42.5	3251 / 87.1		
			30	2.1	684 / 18.3	2825 / 75.7	5457 / 146		
			60	4.1	1161 / 31.1	4618 / 123			
			150	10.3	2567 / 68.8				
		1.2 psig / 83 mbar	2	0.14	90 / 2.4	464 / 12.4	1097 / 29.4	1161 / 31.1	1290 / 34.6
			6	0.41	245 / 6.6	697 / 18.6	1548 / 41.5	1664 / 44.6	
			10	0.69	323 / 8.7	1019 / 27.3	2670 / 71.6		
			30	2.1	671 / 18.0	2554 / 68.4	4592 / 123		
			60	4.1	1135 / 30.4	4193 / 112			
			150	10.3	2567 / 68.8				
1.2 to 2.5 psig / 83 to 172 mbar 1B537127022 Light green	0.2 psig / 14 mbar	1.2 psig / 83 mbar	2	0.14	116 / 3.1	232 / 6.2	464 / 12.4	619 / 16.6	658 / 17.6
			6	0.41	181 / 4.8	452 / 12.1	1097 / 29.4	877 / 23.5	1084 / 29.1
			10	0.69	194 / 5.2	645 / 17.3	1406 / 37.7	1754 / 47.0	
			30	2.1	632 / 16.9	1600 / 42.9	4038 / 108		
			60	4.1	1006 / 27.0	3599 / 95.5	7688 / 206		
			150	10.3	2438 / 65.3	3870 / 104			
		2.5 psig / 172 mbar	6	0.41	142 / 3.8	271 / 7.3	658 / 17.6	671 / 18.0	684 / 18.3
			10	0.69	181 / 4.8	490 / 13.1	774 / 20.7	864 / 23.2	
			30	2.1	568 / 15.2	1032 / 27.7	2296 / 61.5		
			60	4.1	851 / 22.8	2516 / 67.4	7366 / 197		
			150	10.3	2193 / 58.8	3483 / 93.3			
2.5 to 4.5 psig / 172 to 310 mbar 1B537227022 Light blue	0.3 psig / 21 mbar	2.5 psig / 172 mbar	4	0.28	142 / 3.8	194 / 5.2	413 / 11.1	426 / 11.4	477 / 12.8
			8	0.55	181 / 4.8	361 / 9.7	710 / 19.0	735 / 19.7	903 / 24.2
			12	0.83	194 / 5.2	490 / 13.1	929 / 24.9	955 / 25.6	
			30	2.1	426 / 11.4	903 / 24.2	1832 / 49.1		
			60	4.1	658 / 17.6	1729 / 46.3	4076 / 109		
			150	10.3	2012 / 53.9	6656 / 178			
		4.5 psig / 310 mbar	8	0.55	116 / 3.1	245 / 6.6	490 / 13.1	516 / 13.8	542 / 14.5
			12	0.83	155 / 4.1	323 / 8.7	606 / 16.2	851 / 22.8	
			30	2.1	387 / 10.4	761 / 20.4	1355 / 36.3		
			60	4.1	632 / 16.9	1226 / 32.9	3096 / 83.0		
			150	10.3	1393 / 37.3	4992 / 133			
4.5 to 7 psig / 310 to 483 mbar 1B537327052 Black	0.7 psig / 48 mbar	4.5 psig / 310 mbar	9	0.62	206 / 5.5	426 / 11.4	839 / 22.5	968 / 25.9	1045 / 28.0
			12	0.83	232 / 6.2	555 / 14.9	1006 / 27.0	1290 / 34.6	
			30	2.1	516 / 13.8	1097 / 29.4	2077 / 55.7		
			60	4.1	877 / 23.5	2051 / 55.0	3651 / 97.8		
			150	10.3	2064 / 55.3	5999 / 160			
		7 psig / 483 mbar	9	0.62	155 / 4.1	271 / 7.3	593 / 15.9	619 / 16.6	658 / 17.6
			12	0.83	206 / 5.5	374 / 10.0	774 / 20.7	890 / 23.8	
			30	2.1	374 / 10.0	903 / 24.2	1651 / 44.2		
			60	4.1	800 / 21.4	1716 / 46.0	2761 / 74.0		
			150	10.3	2012 / 53.9	4141 / 111			

▭ - Shaded areas indicate inlet pressure is too high for orifice size.

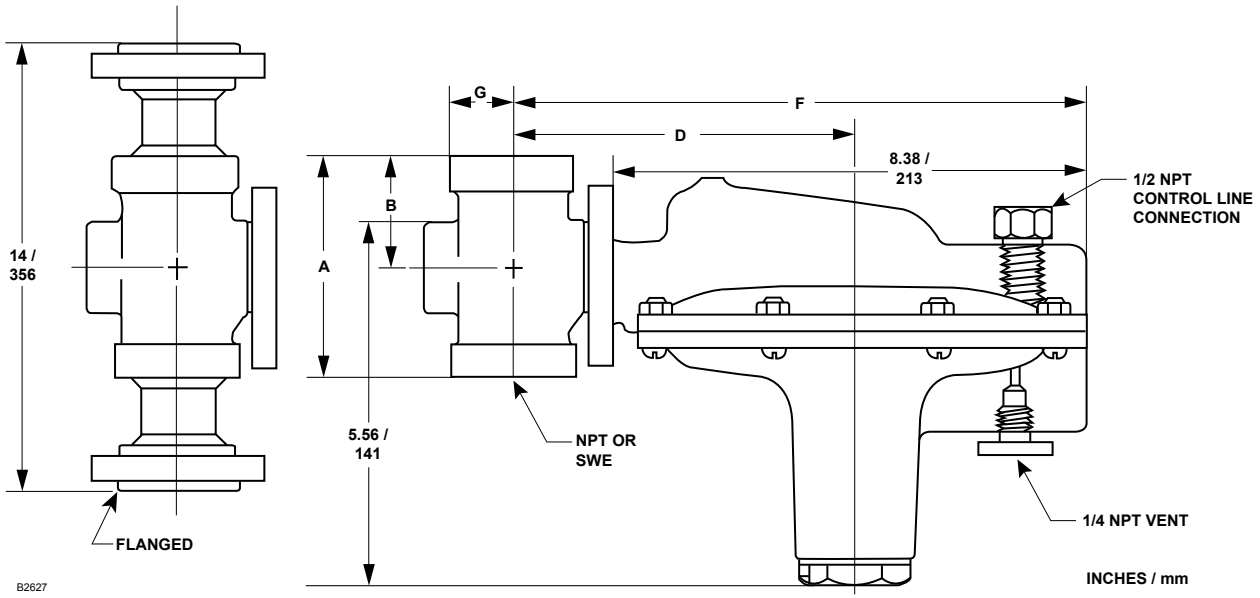

Figure 4. *Dimensions*

Table 8. *Dimensions*

DIMENSIONS, INCHES / mm							
BODY SIZE	A		B		D	F	G
	Ductile Iron	Stainless Steel	Ductile Iron	Stainless Steel	Ductile Iron or Stainless Steel	Ductile Iron or Stainless Steel	Ductile Iron or Stainless Steel
NPS 3/4 or 1 / DN 20 or 25	4.0 / 102	4.12 / 105	2.12 / 53.8	2.25 / 57.2	6.19 / 157	10.12 / 257	1.53 / 38.9

Universal NACE Compliance

Optional materials are available for applications handling sour gases. These constructions comply with the recommendations of all NACE International sour service standards.

The manufacturing processes and materials used by Fisher® Controls assure that all products specified for sour gas service comply with the chemical, physical, and metallurgical requirements of NACE MR0175/ISO 15156 and/or NACE MR0103. Customers have the responsibility to specify correct materials. Environmental limitations may apply and shall be determined by the user.

Ordering Information

When ordering, specify:

Application

1. Type of regulator
2. Body, spring case, diaphragm case, and trim materials
3. Control spring range
4. Orifice size

Construction

Refer to the Specifications in page 2 and to each referenced table. Specify the desired selection whenever there is a choice to be made. Always be sure to specify the regulator type number.

Ordering Guide

Type (Select One)
- ☐ Y690A (internal registration)***
- ☐ Y690AH (high pressure with internal registration)***
- ☐ Y690AM (external registration)***
- ☐ Y690AHM (high pressure with external registration)***

Body Size (Select One)
- ☐ NPS 3/4 / DN 20***
- ☐ NPS 1 / DN 25***

Body Material and End Connection Style (Select One)

Ductile Iron Body
- ☐ NPT***

CF8M Stainless Steel
- ☐ NPT***
- ☐ CL150 RF**
- ☐ CL300 RF**
- ☐ PN 16/25/40**

Spring Case Material (Select One)
- ☐ Ductile iron***
- ☐ CF8M Stainless steel***

Diaphragm Case Material (Select One)
- ☐ Ductile iron***
- ☐ CF8M Stainless steel***

Trim Material (Select One)
- ☐ 303 Stainless steel***
- ☐ 316 Stainless steel**

Diaphragm Material (Select One)
- ☐ Nitrile (NBR) **(standard)***
- ☐ Fluorocarbon (FKM)**
- ☐ Nitrile (NBR) with PTFE Protector**

Disk Material (Select One)
- ☐ Nitrile (NBR) **(standard)***
- ☐ Fluorocarbon (FKM)***
- ☐ Ethylenepropylene (EPDM)**
- ☐ PTFE**
- ☐ Perfluoroelastomer (FFKM)*

Orifice Size (Optional)
- ☐ 1/8-inch / 3.2 mm***
- ☐ 1/4-inch / 6.4 mm***
- ☐ 3/8-inch / 9.5 mm***
- ☐ 1/2-inch / 12.7 mm***
- ☐ 9/16-inch / 14.3 mm***

Outlet Pressure Range (Select One)

Types Y690A and Y690AM
- ☐ 1 to 2.5-inches w.c. / 2 to 6 mbar, Orange***
- ☐ 2.5 to 7-inches w.c. / 6 to 17 mbar, Red***

Types Y690AH and Y690AHM
- ☐ 5 to 10-inches w.c. / 12 to 25 mbar, Red***
- ☐ 7 to 16-inches w.c. / 17 to 40 mbar, Unpainted***
- ☐ 15-inches w.c. to 1.2 psig / 37 mbar to 0.08 bar, Yellow***
- ☐ 1.2 to 2.5 psig / 0.08 to 0.17 bar, Light green***
- ☐ 2.5 to 4.5 psig / 0.17 to 0.31 bar, Light blue***
- ☐ 4.5 to 7 psig / 0.31 to 0.48 bar, Black***

NACE Required
- ☐ Yes

Replacement Parts Kit (Optional)
- ☐ Yes, send one replacement parts kit to match this order.

Regulators Quick Order Guide	
* * *	Standard - Readily Available for Shipment
* *	Non-Standard - Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Office for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

Specification Worksheet

Application:

Specific Use _____

Line Size _____

Fluid Type _____

Specific Gravity _____

Temperature _____

Does the Application Require Overpressure Protection?

☐ Yes ☐ No

Pressure:

Maximum Inlet Pressure _____

Minimum Inlet Pressure _____

Differential Pressure _____

Set Pressure _____

Maximum Flow _____

Accuracy Requirements:

Less Than or Equal To:

☐ 5% ☐ 10% ☐ 20% ☐ 40%

Construction Material Requirements (if known):

_____

_____

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